

0590
0417

3

OIEP

ENTERED

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/902,432

DATE: 04/23/2002 P16
TIME: 15:29:06

Input Set : A:\09902432sequencelisting.txt

Output Set: N:\CRF3\04232002\I902432.raw

3 <110> APPLICANT: Irwin H. Gelman
 4 Susan G. Jaken
 6 <120> TITLE OF INVENTION: TUMOR SUPPRESSOR GENE
 9 <130> FILE REFERENCE: A30558-A-FWC-A 070156.0597
 11 <140> CURRENT APPLICATION NUMBER: 09/902,432
 C--> 12 <141> CURRENT FILING DATE: 2002-04-08
 14 <150> PRIOR APPLICATION NUMBER: 08/978,277
 15 <151> PRIOR FILING DATE: 1997-11-25
 17 <150> PRIOR APPLICATION NUMBER: 08/665,401
 18 <151> PRIOR FILING DATE: 1996-06-18
 20 <150> PRIOR APPLICATION NUMBER: 08/635,121
 21 <151> PRIOR FILING DATE: 1996-04-19
 23 <160> NUMBER OF SEQ ID NOS: 35
 25 <170> SOFTWARE: FastSEQ for Windows Version 4.0
 27 <210> SEQ ID NO: 1
 28 <211> LENGTH: 5134
 29 <212> TYPE: DNA
 30 <213> ORGANISM: Rattus norvegicus
 32 <400> SEQUENCE: 1
 33 ggaaaagaca gagccagcct cggaggagca ggagccggca gaagacacag accaggccag 60
 34 gttgtcagca gactacgaga aggtggagct gcctttggaa gaccagggtg gtgacctgga 120
 35 ggcacgtcga gaggagaagt gtgctccttt ggcaacggaa gtgtttgatg agaagatgga 180
 36 agcccaccaa gaagttgttg cagaggtcca cgtgagcacc gtggagaaga cagaggagga 240
 37 gcagggagga ggaggagagg ctgaaggggg cgtggtggtg gaaggaacag gagaatcctt 300
 38 gccccctgag aaactggctg agccccagga ggtccccag gaagctgagc ctgctgagga 360
 39 gctgatgaag agcagagaga tgtgtgtctc tggaggagac cacactcaac tgacagacct 420
 40 aagtcccgaa gagaagacgc tgcccaaaca ccagaaggc attgtcagtg aggtggagat 480
 41 gctgtcctct caggaaagaa tcaaggtaca ggaaggtccc ttgaagaaac tottcagtag 540
 42 ctcaggctta aagaagctgt ctgggaagaa gcagaagggg aaacgaggag gtgggggaga 600
 43 cgaagagcct ggagaatacc aacacattca caccgaatcc ccagagagtg ctgatgagca 660
 44 gaagggagag agctctgcgt cgtccccga ggagcctgag gagaccacgt gtctggagaa 720
 45 agggccgctg gaagcaccga ggtgggggaa gctgaggaag gaactacttc gtggagagaa 780
 46 gaagaggaag gatcactccc tgggcactct tcaaaaagat ggtgacacc aagaaacggt 840
 47 ccgaagacct tctgagagtg acaaggagga agagctggag aaggtcaaga gcgccacctt 900
 48 gtctctcact gatagcacag tgtcagaaat gcaagatgaa gtcaaaactg ttggtgagga 960
 49 acaaaagcca gaggaaccaa agcgtagggt ggatacttca gtgtcttggg aagcactgat 1020
 50 ttgtgtcgga tcatccaaga agagagcaag gaaggcatcc tottcagata taagagggcc 1080
 51 aaggacactg ggagggggac agtcacagag cagaggagcc cagcaaagac aaagaagccg 1140
 52 aacagacgct gttcctgcca gacccagga gcaggaccaa gcgcaaggaa gttcctcacc 1200
 53 cgagccagcg ggaagccctt ccgaagggga aggtgtctcc acttgggagt catttaaaag 1260
 54 attagtcact ccaagaaaaa aatccaagtc aaaactggaa gagaaagaag ccggaaggac 1320
 55 tctagttgta ggagcaggtt gtccactgag atcgaaccgt gtagagaaga atcttgggtt 1380
 56 tccattaaga aattcatccc cggacggcgg aagaaaaggg cagatgggaa ggcaagaaca 1440

RAW SEQUENCE LISTING

DATE: 04/23/2002

PATENT APPLICATION: US/09/902,432

TIME: 15:29:06

Input Set : A:\09902432sequencelisting.txt

Output Set: N:\CRF3\04232002\I902432.raw

```

57 agccactgtg gaagactcag ggccagtgga gataaatgag gacgagcctg atgtcccagc 1500
58 cgtcgtgcct ctgtctgagt atgatgcagt ggagagggag aagatggaag cccaggggaa 1560
59 tgcggagctg cccagctgct ggggctgtgt agtgtccgag gagctcagta agactctggt 1620
60 ccacactgtg agtgtcgcag tcattgatgg gaccagggca gtcaccagtg tcgaagagcg 1680
61 gtctccttcg tggatatccg ctcccgtaac agaacctctt gaacacacag cgggagaagc 1740
62 catgccacct gttgaagagg tcaactgaaa agacatcatt gcagaagaaa ctctgtgct 1800
63 caccagacg ttaccagagg gtaaagatgc ccatgacgac atggtcacca gtgaagtgga 1860
64 ttacacctca gaagctgtga cagccacaga gacctcagag gctctccgta ctgaagaagt 1920
65 taccgaagca tcgggggccc aagagaccac agacatggtg tccgcagttt cccagctgac 1980
66 tgactcccca gacaccacag aggaagccac cccagttcag gaggtagagg gtggtgtgct 2040
67 agatacagaa gaagaggagc gccagacgca ggccatcctc caagccgttg cagacaaggt 2100
68 gaaagaggag tcccaggtgc ctgcaaccca gactgtgcag agaacggggt caaaagcact 2160
69 ggagaagggt gaggaggtag aggaggactc cgaagtgtcg gcttcggaga aagagaagga 2220
70 cgttatgccg aaaggaccoc tgcaggaagc tggagctgag catcttgac agggctctga 2280
71 gactggacag gctactccag agagccttga agttcctgaa gtcacagcag atgtagacca 2340
72 tgtcgccacg tgccagggtta tcaagctcca gcagctgatg gaacaggccg tggcccctga 2400
73 gtcacccgaa accttgacag acagtgcagc aaatggaagc actcccttag cagattcaga 2460
74 cactgcagat gggacacagc aagatgaaac cattgacagc caggacagta aagccactgc 2520
75 agctgtcagg cagtcacagg tcacagaaga agaggcggct actgctcaga aagaggagcc 2580
76 ttgcacacta cctaataatg ttccagcccc ggaagaacat ggggaagaac caggaagaga 2640
77 tgttcttgaa cctacacagc aagagcttgc tgctgcagcc gtgcccgtct ggcaaaagac 2700
78 tgagggtggg caagagggtg aggttgactg gttggatgga gaaaaagtca aagaagaaca 2760
79 ggaggtgttt gtacactctg gacccaacag tcaaaaaggc gctgatgtga catatgacag 2820
80 tgaagtgatg ggagtggccg ggtgtcagga aaaggagagt actgaagtgc agagtcttag 2880
81 cctggaggag ggagagatgg aaactgacgt tgaaaaggag aaaagggaga caaagccaga 2940
82 gcaagtgagt gaagaagggt agcaggaaac agccgtcctt gagcatgaaa ggaactacgg 3000
83 gaagccagtc ctgacacttg acatgccagc ctgagagagg ggggaaggcag tgggaagcct 3060
84 tggaggaagc ccttctctcc cagaccaaga caaagcaggt tgcatagagg ttcaagttca 3120
85 aagcctggac acaacagtca ctcaaacagc agaagctgtg gaaaagggtca tagaaacggg 3180
86 tgtgatttca gagacagggt aaagtccaga gtgtgtagggt gcacacttat taccagctga 3240
87 gaagtctctt gcaacgggtg gccactggac tcttcagcat gcagaggaca cggtagccct 3300
88 ggggcctgag tctcaggcag aatccatccc aatcatagta actcctgctc ctgaaagcac 3360
89 cctacatcct gacctacaag gagaaataag cgcaccccag agagagcgat cagaggaaga 3420
90 ggacaagcca gatgtggtc ctgatgctga cggcaaggag agtacagcaa tcgacaaagt 3480
91 cctcaaggct gaacctgaga tcttggaaat tgagagtaag agcaacaaga ttgtgtgtaa 3540
92 cgtcattcag acagccgttg accagttcgc acgtacagaa acagcccccg aaactcatgc 3600
93 ttatgattca cagaccaggg ttcttgcaat gcgcttggac agcagggagc ccaacagatg 3660
94 ctggacaaaa atgaaagtgg ccaagatgaa acaccagtg ccgcagccca gagaggactt 3720
95 gcaagtcttg accgttctgg aggcattggt cagctcgga atgcttgccg cgcttgagc 3780
96 tgaaagcgcc ggtgtcaaa taagcattga gaagctgccc cctcaacca aagatcaaaa 3840
97 ggagcatgct gctgatggc ctcagctcca aagcttagcc caggcagagg cagtgtctgg 3900
98 aaacctaac aaagaatccc cagacacca cggaccaaa ctaaccgagg agcgatgcc 3960
99 ccaaaagtgg aggtccagga agaagaaatg tctaccaagt cagtcaaaga gaacaaggcc 4020
100 caggcagaag aggacctgca ggagccaaag ggagacctgg cagaatccta agatgttagt 4080
101 tgctcattgt acatctgtaa gaccagaatg tgaaaacaag tcacagaaca agatgtgct 4140
102 gttgggacct tggaccaaga ttccagagcc catgagatcc agagagcagg gccgtccaat 4200
103 gatttccacc cagtagagca ccccgacaat tctgaggctt catcgggagc tagagccagc 4260
104 taacatttcc tcgtttcaag actgcctttg atttgcccct tgatgccgtc cgtgtatttc 4320
105 taacatttcc tcgtttcaag actgcctttg atttgcccct tgatgccgtc cgtgtatttc 4380

```

RAW SEQUENCE LISTING

DATE: 04/23/2002

PATENT APPLICATION: US/09/902,432

TIME: 15:29:06

Input Set : A:\09902432sequencelisting.txt

Output Set: N:\CRF3\04232002\I902432.raw

```

106 ggattttaagg tcctgcgttc tcaacctgga accaattctg ccatacctag ttccacttct 4440
107 caaactggag catcctcctt tatgtattta tatgtatgtt ttatgtagtc ctccctcctgt 4500
108 acctattgta ttttttttc taacgtttta gcacatgctt tttgtattat gcaatatata 4560
109 acgggtgtgc agccatagcg acgctttgaa aagctccaag cctcaactgt aacctgcagc 4620
110 aaacagataa cattcctggc aagaagagac aagtcttttt taaagtttac tgatgcttag 4680
111 atctgtgggc ttctagtccct ctgaaagtgg ttgttttcct atgcacagcg agctcagaaa 4740
112 taaaaaaccac attttgaaac atccaggatg tcccaatatt accatgattt tttccccct 4800
113 ttttgctaac ccagtcaggg ttggaaagaa gtctcctctg tgtcagatta agccctgtct 4860
114 cttaatgata tggacaaatg agtgtgccta aggccatgag atgtttccta atgcagaagg 4920
115 aatctgttgt acgttttttt gattgtactc ttctatgctg gaccgaattc atatgcagat 4980
116 cgaagtgagt cctgttcttt acagatggta ttttgataga tactggagtt tgtctgtgtt 5040
117 atatctgtgc ccttcttta agaacaatgt tgcattatgt tcctttggat aaattgtgat 5100
118 ttgacaactg atttaaataa acatatttga ctac 5134

```

122 <210> SEQ ID NO: 2

123 <211> LENGTH: 1346

124 <212> TYPE: PRT

125 <213> ORGANISM: Rattus norvegicus

127 <400> SEQUENCE: 2

```

128 Met Glu Ala His Gln Glu Val Val Ala Glu Val His Val Ser Thr Val
129 1 5 10 15
130 Glu Lys Thr Glu Glu Gln Gly Gly Gly Glu Ala Glu Gly Gly
131 20 25 30
132 Val Val Val Glu Gly Thr Gly Glu Ser Leu Pro Pro Glu Lys Leu Ala
133 35 40 45
134 Glu Pro Gln Glu Val Pro Gln Glu Ala Glu Pro Ala Glu Glu Leu Met
135 50 55 60
136 Lys Ser Arg Glu Met Cys Val Ser Gly Gly Asp His Thr Gln Leu Thr
137 65 70 75 80
138 Asp Leu Ser Pro Glu Glu Lys Thr Leu Pro Lys His Pro Glu Gly Ile
139 85 90 95
140 Val Ser Glu Val Glu Met Leu Ser Ser Gln Glu Arg Ile Lys Val Gln
141 100 105 110
142 Gly Ser Pro Leu Lys Lys Leu Phe Ser Ser Ser Gly Leu Lys Lys Leu
143 115 120 125
144 Ser Gly Lys Lys Gln Lys Gly Lys Arg Gly Gly Gly Gly Asp Glu Glu
145 130 135 140
146 Pro Gly Glu Tyr Gln His Ile His Thr Glu Ser Pro Glu Ser Ala Asp
147 145 150 155 160
148 Glu Gln Lys Gly Glu Ser Ser Ala Ser Ser Pro Glu Glu Pro Glu Glu
149 165 170 175
150 Thr Thr Cys Leu Glu Lys Gly Pro Leu Glu Ala Pro Arg Met Gly Lys
151 180 185 190
152 Leu Arg Lys Glu Leu Leu Arg Gly Glu Lys Lys Arg Lys Asp His Ser
153 195 200 205
154 Leu Gly Ile Leu Gln Lys Asp Gly Asp Thr Gln Glu Thr Val Arg Arg
155 210 215 220
156 Pro Ser Glu Ser Asp Lys Glu Glu Glu Leu Glu Lys Val Lys Ser Ala
157 225 230 235 240
158 Thr Leu Ser Ser Thr Asp Ser Thr Val Ser Glu Met Gln Asp Glu Val

```

RAW SEQUENCE LISTING

DATE: 04/23/2002

PATENT APPLICATION: US/09/902,432

TIME: 15:29:06

Input Set : A:\09902432sequencelisting.txt

Output Set: N:\CRF3\04232002\I902432.raw

```

159          245          250          255
160 Lys Thr Val Gly Glu Glu Gln Lys Pro Glu Glu Pro Lys Arg Arg Val
161          260          265          270
162 Asp Thr Ser Val Ser Trp Glu Ala Leu Ile Cys Val Gly Ser Ser Lys
163          275          280          285
164 Lys Arg Ala Arg Lys Ala Ser Ser Ser Asp Ile Arg Gly Pro Arg Thr
165          290          295          300
166 Leu Gly Gly Gly Gln Ser Gln Ser Arg Gly Gly Gln Gln Arg Gln Arg
167 305          310          315          320
168 Ser Arg Thr Asp Ala Val Pro Ala Ser Thr Gln Glu Gln Asp Gln Ala
169          325          330          335
170 Gln Gly Ser Ser Ser Pro Glu Pro Ala Gly Ser Pro Ser Glu Gly Glu
171          340          345          350
172 Gly Val Ser Thr Trp Glu Ser Phe Lys Arg Leu Val Thr Pro Arg Lys
173          355          360          365
174 Lys Ser Lys Ser Lys Leu Glu Glu Lys Glu Ala Gly Arg Thr Leu Val
175          370          375          380
176 Val Gly Ala Gly Cys Pro Leu Arg Ser Asn Arg Val Glu Lys Asn Leu
177 385          390          395          400
178 Gly Phe Pro Leu Arg Asn Ser Ser Pro Asp Gly Gly Arg Lys Gly Gln
179          405          410          415
180 Met Gly Arg Gln Glu Gln Ala Thr Val Glu Asp Ser Gly Pro Val Glu
181          420          425          430
182 Ile Asn Glu Asp Glu Pro Asp Val Pro Ala Val Val Pro Leu Ser Glu
183          435          440          445
184 Tyr Asp Ala Val Glu Arg Glu Lys Met Glu Ala Gln Gly Asn Ala Glu
185          450          455          460
186 Leu Pro Ser Cys Trp Gly Cys Val Val Ser Glu Glu Leu Ser Lys Thr
187 465          470          475          480
188 Leu Val His Thr Val Ser Val Ala Val Ile Asp Gly Thr Arg Ala Val
189          485          490          495
190 Thr Ser Val Glu Glu Arg Ser Pro Ser Trp Ile Ser Ala Ser Val Thr
191          500          505          510
192 Glu Pro Leu Glu His Thr Ala Gly Glu Ala Met Pro Pro Val Glu Glu
193          515          520          525
194 Val Thr Glu Lys Asp Ile Ile Ala Glu Glu Thr Pro Val Leu Thr Gln
195          530          535          540
196 Thr Leu Pro Glu Gly Lys Asp Ala His Asp Asp Met Val Thr Ser Glu
197 545          550          555          560
198 Val Asp Phe Thr Ser Glu Ala Val Thr Ala Thr Glu Thr Ser Glu Ala
199          565          570          575
200 Leu Arg Thr Glu Glu Val Thr Glu Ala Ser Gly Ala Glu Glu Thr Thr
201          580          585          590
202 Asp Met Val Ser Ala Val Ser Gln Leu Thr Asp Ser Pro Asp Thr Thr
203          595          600          605
204 Glu Glu Ala Thr Pro Val Gln Glu Val Glu Gly Gly Val Leu Asp Thr
205          610          615          620
206 Glu Glu Glu Glu Arg Gln Thr Gln Ala Ile Leu Gln Ala Val Ala Asp
207 625          630          635          640

```

RAW SEQUENCE LISTING

DATE: 04/23/2002

PATENT APPLICATION: US/09/902,432

TIME: 15:29:06

Input Set : A:\09902432sequencelisting.txt

Output Set: N:\CRF3\04232002\I902432.raw

```

208 Lys Val Lys Glu Glu Ser Gln Val Pro Ala Thr Gln Thr Val Gln Arg
209                               645                               650                               655
210 Thr Gly Ser Lys Ala Leu Glu Lys Val Glu Glu Val Glu Glu Asp Ser
211                               660                               665                               670
212 Glu Val Leu Ala Ser Glu Lys Glu Lys Asp Val Met Pro Lys Gly Pro
213                               675                               680                               685
214 Val Gln Glu Ala Gly Ala Glu His Leu Ala Gln Gly Ser Glu Thr Gly
215                               690                               695                               700
216 Gln Ala Thr Pro Glu Ser Leu Glu Val Pro Glu Val Thr Ala Asp Val
217 705                               710                               715                               720
218 Asp His Val Ala Thr Cys Gln Val Ile Lys Leu Gln Gln Leu Met Glu
219                               725                               730                               735
220 Gln Ala Val Ala Pro Glu Ser Ser Glu Thr Leu Thr Asp Ser Glu Thr
221                               740                               745                               750
222 Asn Gly Ser Thr Pro Leu Ala Asp Ser Asp Thr Ala Asp Gly Thr Gln
223                               755                               760                               765
224 Gln Asp Glu Thr Ile Asp Ser Gln Asp Ser Lys Ala Thr Ala Ala Val
225                               770                               775                               780
226 Arg Gln Ser Gln Val Thr Glu Glu Glu Ala Ala Thr Ala Gln Lys Glu
227 785                               790                               795                               800
228 Glu Pro Ser Thr Leu Pro Asn Asn Val Pro Ala Gln Glu Glu His Gly
229                               805                               810                               815
230 Glu Glu Pro Gly Arg Asp Val Leu Glu Pro Thr Gln Gln Glu Leu Ala
231                               820                               825                               830
232 Ala Ala Ala Val Pro Val Trp Gln Lys Thr Glu Val Gly Gln Glu Gly
233                               835                               840                               845
234 Glu Val Asp Trp Leu Asp Gly Glu Lys Val Lys Glu Glu Gln Glu Val
235                               850                               855                               860
236 Phe Val His Ser Gly Pro Asn Ser Gln Lys Ala Ala Asp Val Thr Tyr
237 865                               870                               875                               880
238 Asp Ser Glu Val Met Gly Val Ala Gly Cys Gln Glu Lys Glu Ser Thr
239                               885                               890                               895
240 Glu Val Gln Ser Leu Ser Leu Glu Glu Gly Glu Met Glu Thr Asp Val
241                               900                               905                               910
242 Glu Lys Glu Lys Arg Glu Thr Lys Pro Glu Gln Val Ser Glu Glu Gly
243                               915                               920                               925
244 Glu Gln Glu Thr Ala Ala Pro Glu His Glu Arg Asn Tyr Gly Lys Pro
245                               930                               935                               940
246 Val Leu Thr Leu Asp Met Pro Ser Ser Glu Arg Gly Lys Ala Leu Gly
247 945                               950                               955                               960
248 Ser Leu Gly Gly Ser Pro Ser Leu Pro Asp Gln Asp Lys Ala Gly Cys
249                               965                               970                               975
250 Ile Glu Val Gln Val Gln Ser Leu Asp Thr Thr Val Thr Gln Thr Ala
251                               980                               985                               990
252 Glu Ala Val Glu Lys Val Ile Glu Thr Val Val Ile Ser Glu Thr Gly
253                               995                               1000                               1005
254 Glu Ser Pro Glu Cys Val Gly Ala His Leu Leu Pro Ala Glu Lys Ser
255                               1010                               1015                               1020
256 Ser Ala Thr Gly Gly His Trp Thr Leu Gln His Ala Glu Asp Thr Val

```

RAW SEQUENCE LISTING ERROR SUMMARY
PATENT APPLICATION: US/09/902,432

DATE: 04/23/2002
TIME: 15:29:07

Input Set : A:\09902432sequencelisting.txt
Output Set: N:\CRF3\04232002\I902432.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:19; Xaa Pos. 3,4,5,7,11,12,16,18,19,20

Seq#:21; Xaa Pos. 20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38

Seq#:21; Xaa Pos. 39,40,41,42,43,44,45,46

Seq#:22; Xaa Pos. 6,7,8,9

VERIFICATION SUMMARY

DATE: 04/23/2002

PATENT APPLICATION: US/09/902,432

TIME: 15:29:07

Input Set : A:\09902432sequencelisting.txt

Output Set: N:\CRF3\04232002\I902432.raw

L:12 M:271 C: Current Filing Date differs, Replaced Current Filing Date
L:812 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:816 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:19
L:820 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:19
L:824 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:19
L:828 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:19
L:832 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:19
L:836 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:19
L:840 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:19
L:844 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:19
L:848 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:19
L:849 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:19 after pos.:0
L:851 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:19 after pos.:16
L:881 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:21 after pos.:16
L:883 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:21 after pos.:32
L:900 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:22 after pos.:0
L:1049 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!
L:1053 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:35
L:1057 M:258 W: Mandatory Feature missing, <220> not found for SEQ ID#:35